

RESPONSE AND REQUEST FOR RECONSIDERATION

The Examiner had indicated that new test data demonstrating the effect of the claimed condensation products versus other friction modifiers disclosed in the Ward reference would be favorably considered. Such data is presented in the attached Declaration from Dr. Patterson. In this data, a marked improvement is shown in terms of the friction properties of a lubricant using the condensation product of a fatty acid with an ethylenepolyamine (in particular, isostearic acid + tetraethylenepentamine) compared with the use of several other friction modifiers from Ward, WO 00/70001. The other friction modifiers that were examined include a fatty ester (glycerol monooleate, see Ward page 18 line 17), a fatty amide (oleyl amide, see Ward page 18 line 16), and 1-hydroxyethyl-2-heptadecenyl imidazoline. The latter is a condensation product similar to that of the present invention, except that the amine component is not an ethylenepolyamine but rather N-hydroxyethyl ethylenediamine, listed as a preferred material of Ward (page 19 line 30).

The results of the testing show that only the formulation containing the condensation product of fatty acid with polyamine (Inventive Example 2) meets the friction and durability requirements for an automatic transmission fluid. Unlike the other formulations, that of the present invention provides stable friction performance within the desired ranges for up to 20,000 test cycles. That is, the ratio S1/D (static friction coefficient/dynamic friction coefficient) remains between 0.9 and 1.0 after a brief initial break-in period. Friction ratios within that range are required to avoid shudder, which is typically caused by the sudden gripping of friction plates upon clutch engagement, which can occur if S1/D is greater than 1. Further, the S1/D ratio comes to within the acceptable range quickly in the durability test, without an extended and objectionable "green" or break-in period in which S1/D is too high (up to 600 cycles for comparative examples 3 and 4). Likewise, the actual value of the static coefficient of friction is acceptably high, in the range of about 0.12 and above. Among the materials examined, only the claimed ethylenepolyamine condensation product imparts the overall desired performance to the automatic transmission fluid.

We note, for completeness, that a condensation product of isostearic acid and tetraethylenepentamine is disclosed in Ward as a component of the lubricant in Example 19 on page 27 (as "Supplement B"). The formulation of Example 19, however, remains distinguished from the claims of the present invention in that the phosphorus-containing component is only generically reported as "alkyl phosphite + phosphoric acid." The present invention requires the presence, in particular, of an alkyl phosphite wherein the alkyl group contains 12 to 30 carbon atoms. Applicants have previously shown, in a similar lubricant formulation, that alkyl phosphites with long chain alkyl groups (C14) provide improved wear and anti-shudder performance compared to those with short

alkyl groups (C6). This was reported in the Declaration of James Sumiejski of April 28, 2006, submitted in the response of May 1, 2006.

For the foregoing reasons, it is submitted that all claims are novel and unobvious. Accordingly, an early and favorable reconsideration of the rejections made in the prior office actions is respectfully requested. It is believed that no additional fees are due in connection with this submission. However, any required fees or underpayment or overpayment of fees should be charged (or credited) to Deposit Account 12-2275 (The Lubrizol Corporation).

Respectfully submitted,

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